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Procedia Food Science 2 (2013) 129 – 133

Procedia Food Science

36th National Nutrient Databank Conference

"My fries were the size of an iPhone®": How portion size is reported in the Fuel 2 Fight study

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Abstract

Capturing portion size estimates is a constant challenge. Our objective was to characterize reported portion size during face-to-face and telephone 24-hour diet recalls among career fire fighters in the Fuel 2 Fight study. Trained nutritionists reviewed recalls and categorized reported portion size into weights, household measures, servings & items (including common alternatives for portion size), or food models. Two-dimensional models were most frequently used in face-to-face recalls, whereas household measures, and servings & items were more frequently used in telephone recalls. Thus, expanding use of common non-food objects with a known volume could be an important portion size alternative for telephone recalls.

Keywords: portion size; 24-hour recall; servings; food models

1. Introduction

Portion size estimation is challenging. Current portion size measurement aids (PSMA) include three dimensional models, two dimensional (2-D) models, household measures, food models, pictures, servings and common objects [1,2,3,4]. Food models with a known dimension and/or volume offer reliable estimates that can be easily converted to gram weights [5,6]. Individuals' frequency of use of different PSMA to describe their intake is not well described. As well, it is not known if PSMA use differs by recall method (e.g. face-to-face vs. telephone recalls). It is challenging to have PSMA available to facilitate telephone diet recalls when participants are free living and may provide a diet interview while

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doi:10.1016/j.profoo.2013.04.020

away from their home or office. The objective of this brief report is to clearly describe the difference in frequency of use of PSMA between face- to-face and telephone interviews among career fire fighters participating in the Fuel 2 Fight longitudinal study assessing the nutritional environment of the fire service.

2. 2. Materials and Methods

The sample consists of 390 US fire fighters from the Fuel 2 Fight study. Of these, 381 were male (98%); the mean age was 39 years. The participants were asked to complete one face-to-face 24-hour dietary recall interview at the fire station and a second follow-up telephone interview on the fire fighters' off duty day. A total of 389 (100%) completed a face-to-face interview and 320 (82%) completed a telephone interview, for 709 completed recalls.

Interviewers used multiple pass methodology and introduced fire fighters to the different methods to describe the quantity of intake during the face-to-face interview. They offered participants use of weight, household measures, 2-D food models, or servings & items (which included common alternatives for portion size (CAPS)) to describe the quantity of food consumed. CAPS is a reference sheet of common items such as mobile phones, balls, and a check book. Each object has a fixed size with dimensions identified (Figures 1-2). The authors developed CAPS with gram weights calculated for common foods associated with each different object. Gram weight information was utilized from the USDA Food and Nutrient Database for Dietary Studies [7]. Each respondent was given a copy of 2D food models to take home for the telephone recall. During the interview process, each respondent was allowed to self-initiate a method for describing the quantity of intake.

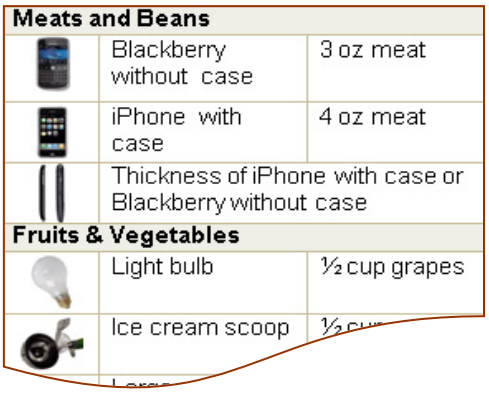
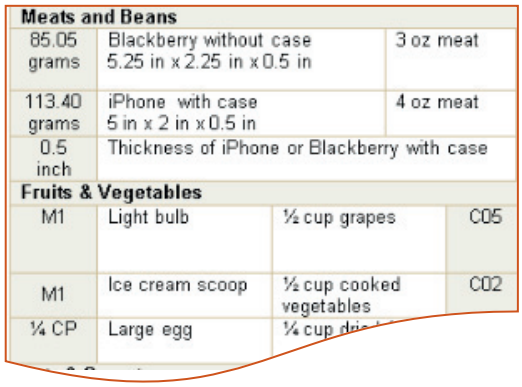


Fig.1.Excerpt of CAPS portion size tool for telephone 24-hour recalls



Meats and Beans			
85.05 grams	Blackberry without case 5.25 in x 2.25 in x 0.5 in		3 oz meat
113.40 grams	iPhone with case 5 in x 2 in x 0.5 in		4 oz meat
0.5 inch	Thickness of iPhone or Blackberry with case		
Fruits & Vegetables			
M1	Light bulb	½ cup grapes	C05
M1	Ice cream scoop	½ cup cooked vegetables	C02
¼ CP	Large egg	¼ cup	

Fig. 2.CAPS portion size tool with Food Intake Analysis System [8] food model designations

One all interviews were complete, the food portions in each recall were divided into one of four categories by trained dietitians: weights, household measures, 2-D models, and servings & items. Weights consisted of foods reported in pounds, dry ounces or grams. Household measures were foods reported in quantities of measuring cups, measuring spoons, liters, or fluid ounces. The 2-D models were foods described using diagrams of rectangles, circles, glasses, spoons, bowls, mounds, wedges or ruler dimensions. Servings & items were foods reported as individual quantities (e.g. 20 almonds or 1 package) or described with CAPS (e.g. 1 check book).

3. Results

The frequency of PSMA choices from all recalls were 10.5% weights, 28.9% household measures, 36.5% 2-D models and 24.1% servings & items. Figure 3 describes the percent of PSMA choices in the face-to-face recalls. 2-D models were most frequent among face-to-face recalls (48.9%) and household measures were most frequent in telephone recalls (35.3%) with servings and items a close second at 30%. When comparing telephone and face-to-face recalls, servings & items were reported more frequently among telephone recalls (30% vs. 19% respectively) and CAPS were reported in 86% of telephone recalls versus 14% of face-to-face recalls. The most common CAPS items selected were the ice cream scoop (29%), baseball (16%) and iPhone® (12%) (Figure 5). Weights were the least common aid used in both recall methods (7.6% of face-to-face recalls and 14.4% of telephone recalls).

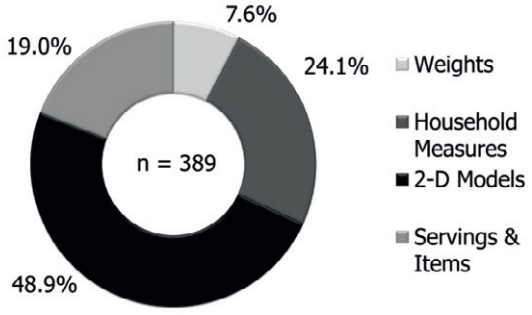


Fig.3.Categories of portion size descriptions in face-to-face recalls

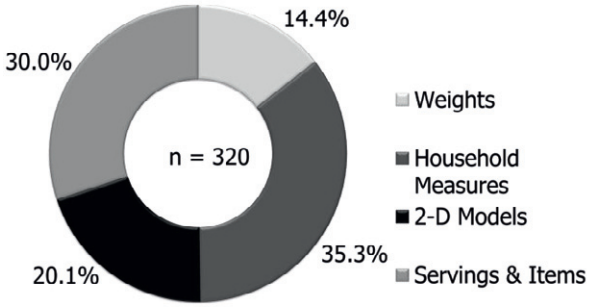


Fig.4.Categories of portion size descriptions in telephone recalls

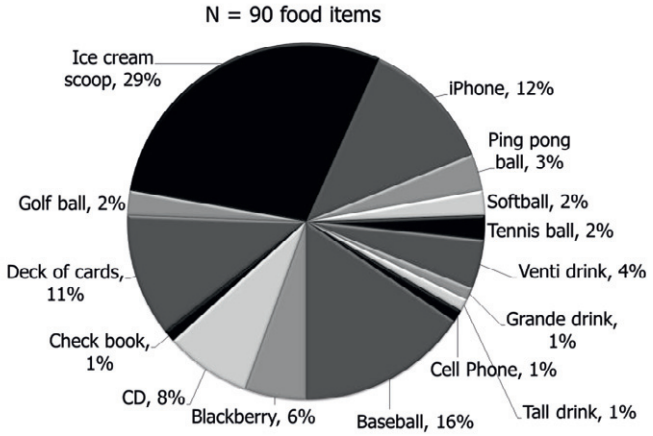


Fig. 5.Common alternatives for portion size descriptions reported in all recalls

4. Conclusion

Twenty-four hour dietary recall interviews are most often completed by telephone for cost efficiency. Our results suggest that for the fire fighters in this study, household measures and servings & items were the favored methods of reporting portion size in telephone interviews, compared to more frequent use of 2-D models in face-to-face interviews. Even though fire fighters were provided with 2-D model materials for the follow-up telephone interview, they preferred using more common or familiar PSMA (cups, spoons, ounces, package, piece, iPhone, gold ball, etc.) to report portion sizes. There may be incidental reasons for this difference. First, the interviewers frequently suggested options to the fire fighters to elicit accurate information, and most often directed them to 2-D models during face-to-face interviews to clarify reported portions, even though the fire fighters may have initially described their portion size using other PSMA. Second, the fire fighters typically completed the telephone interview on their cell phone away from home and therefore did not have the 2-D models available for the off-duty-day recall; instead they used measures that both they and the interviewer were familiar with. Expanding the use of servings & items and common non-food objects with a known volume (CAPS) could be an important portion size alternative for telephone recalls since participants are frequently preoccupied, away from

home, or using cell phones, which decreases the likelihood of utilizing take-home materials provided for recalls. Expanding and updating CAPS however, will require ongoing maintenance, just as portion sizes of manufactured or processed foods in nutrient data bases require frequent updating. Common items like cell phones (i.e., iPhone® and Blackberry®) will continue to evolve as new products sweep the market and the established ones change in size, thus requiring occasional updates to dimensions for calculating gram weight equivalents. Future research conducting telephone recalls may benefit from providing interviewers with CAPS to prompt for portion sizes which are universally available and can easily be converted to gram weights.

Acknowledgements

This research was supported by the Assistance to Fire Fighters Grant Program (FEMA; EMW-2009-FP-001971 and EMW-2010-FP-01812). We thank Ann Abraham for her data management efforts on this project.

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Presented at NNDC (March 25-28, 2012 – Houston, TX) as Poster #6